Description of two new species in the genus *Forcipomyia* (Diptera: Ceratopogonidae) from China

Yangqing LIU[1], Haiying CHEN[1], Yixin YU[2①]

1. *Nanchang Center for Disease Control and Prevention, Nanchang, Jiangxi 330038, China*

2. *Institute of Microbiology and Epidemiology, Academy of Military Medical Sciences, Beijing 100019, China*

Abstract: Two new species of biting midges in the genus of *Forcipomyia* Meigen, 1818 are described and illustrated: *Forcipomyia* (*Microhelea*) *clypedus* Liu and Yu sp. nov. and *Forcipomyia* (*Caloforcipomyia*) *longipenis* Yu and Liu sp. nov., respectively.

Key words: biting midges; taxonomy; distribution

中国江西铗蠓属两新种描述（双翅目：蠓科）

刘仰青[1]，陈海婴[1]，虞以新[2①]

1. 南昌市疾病预防控制中心，江西 南昌 330038；2. 军事医学科学院微生物流行病研究所，北京 100019

摘要：记述采自中国江西井冈山的铗蠓属2新种：盾形铗蠓*Forcipomyia* (*Microhelea*) *clypedus* Liu and Yu sp. nov.和长茎铗蠓 *Forcipomyia* (*Caloforcipomyia*) *longipenis* Yu and Liu sp. nov.。

关键词：蠓；分类；分布

Introduction

Forcipomyiinae Lenz, 1934, a worldwide genus, is one of the largest in the family of Ceratopogonidae, based on species abundance. Unlike many other midges, they are not bloodsuckers of man or other warm-blooded animals. But some adult species are the important pollinators of tropical and subtropical cultivated plants (Young 1986; Winder 1977; Martínez *et al.* 2000).

Borkent (2015), in the catalog of new world ceratopogonids, listed 34 species in the subgenus *Caloforcipomyia* Saunders and 101 species in the subgenus *Microhelea* Kieffer worldwide. Based on this catalog, 3 species in the subgenus *Caloforcipomyia* Saunders, 1956 and 19 species in the subgenus *Microhelea* Kieffer, 1917 have been recorded in China. These records are almost the same as Yu *et al*. reported in 2006. Until now, no other new species in this group have been subsequently described from China.

Here, two new species of biting midges in the genus *Forcipomyia* Meigen from Jinggang Mountain are described. With the addition of these two new species, there should be 24 species belonging to the two subgenera in China.

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① Corresponding author, E-mail: yyxin100@126.com

Material and methods

Specimens were slide-mounted in phenol-balsam in the manner described by Yu *et al*. (2006). Diagnostic characters were illustrated using a camera lucida attached to a Leica DM750 microscope; photomicrographs of the wings and holotype males were taken with a Leica S60. The measurements of the wings and antennae are in millimeters.

The abbreviations are as follows: F—femur, T—tarsus, F-T—leg segments lengths from femur to tarsomere 5; AR—Antennal ratio: total length of flagellomeres 11–13 divided by flagellomeres 1–10; TR—Tarsal ratio: length of tarsomere 1 divided by length of tarsomere II; CR—Costal ratio.

Type specimens are deposited in the Medical Entomology Collection of the Institute of Microbiology and Epidemiology, Academy of Military Medical Sciences, Beijing, China.

Taxonomy

1. ***Forcipomyia (Microhelea) clypedus*** **Liu and Yu sp. nov.** (Figs. 1–4)

Diagnosis. Moderate size, body yellow brown, scutellum with 11 stout bristles, aedeagus peltate shape, parameres scissor-shaped.

Male. Moderate size, body yellow brown.

Head. Compound eyes bare and broadly contiguous. Antenna pale brown, with long, dense and brown plume setae, well-developed; the 12th segment is the longest, distal 4 segments distinctly elongated, AR1.15. Palpus dark brown, the 3rd segment is the longest, distal 1/3 excavated by a small, round, moderately deep sensory pit, 4–5 segments completely fused together, PR 1.82 (Fig. 2).

Thorax. Dark and light brown, mesonotum dark brown, posterior border of scutellum with 11 stout bristles. Wing length 1.35 mm, width 0.37 mm (n = 2), macrotrichia abundant in the wing, the second radial cell is short and entirely within dark spot, CR 0.53 (Fig.1). Legs pale yellow, without any ring marks; hind tibia with 7 terminal bristles, F-T(III)200 : 200 : 43 : 115 : 63 : 40 : 26, TR 0.34.

Abdomen. Dark brown, 2–4 tergites each with distinctly narrow pale band. Dististyle slender and curved. Parameres swollen in the midportion, fused at the base, distal 1/3 divided into two, scissor-shaped (Fig. 3). Aedeagus broad at base, basal arch extending to one quarter of total length, anterior margin of arch strongly sclerotized, anterior margins of main body peltate-shaped, distal process round and even (Fig. 4).

Female. Unknown.

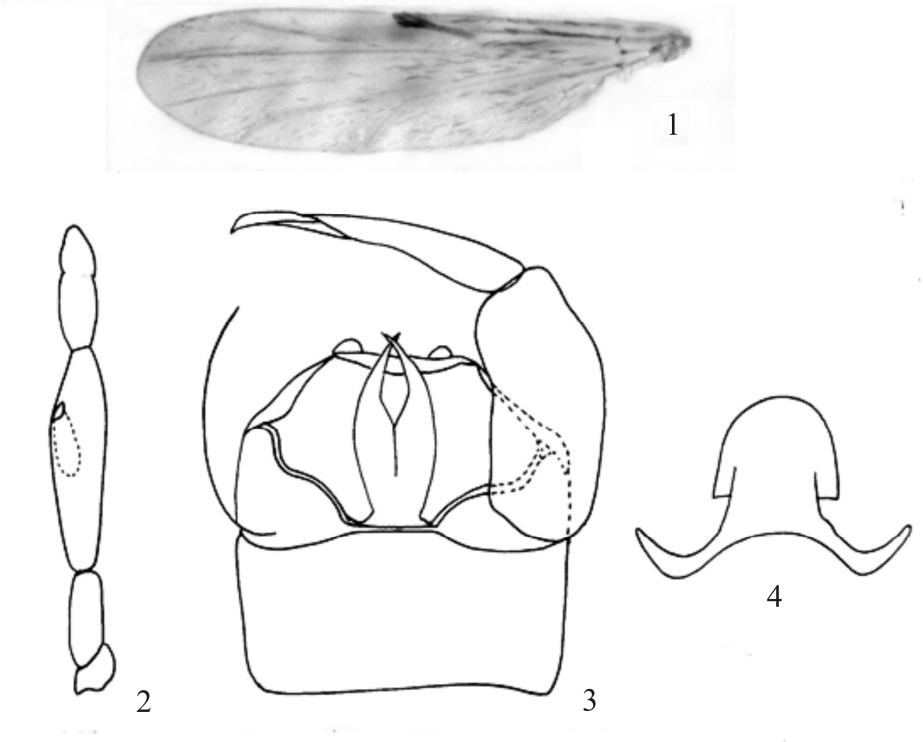
Holotype. 1♂, **China**, Jiangxi Province, Jinggangshan Mountain, N26° 36.850, E114° 11.119, collected in 21-XI-2011, CDC light trap. Deposited in the Medical Entomology Collection of Institute of Microbiology and Epidemiology, Academy of Military Medical Sciences, Beijing, China.

Distribution. Jinggangshan Mountain, Jiangxi Province, China, known only from the type locality.

Etymology. This species epithet is named after the shape of aedeagus.

Remarks. This species very much resembles *Forcipomyia novaguineae* Tokunaga, 1959 but shows two quite definite points of distinction in the paramere and aedeagus: fused at base,

swollen in the midportion, distal 1/3 divided into two, scissor-shaped; aedeagus broad at base, basal arch extending to 1/4 of total length, anterior margins of main body peltate-shaped, distal process round and smooth.



Figures 1–4. *Forcipomyia* (*Microhelea*) *clypedus* Liu and Yu sp. nov. (male). 1. Wing photograph; 2. Palpus; 3. Genitalia (aedeagus removed); 4. Aedeagus.

2. ***Forcipomyia (Caloforcipomyia) longipenis*** **Yu and Liu sp. nov.** (Figs. 5–7)

Diagnosis. Moderate size, body brown, scutellum with 7 stout bristles, gonostylus slender, V-shaped; aedeagal parameral with slender median apophysis, which ends slightly curved.

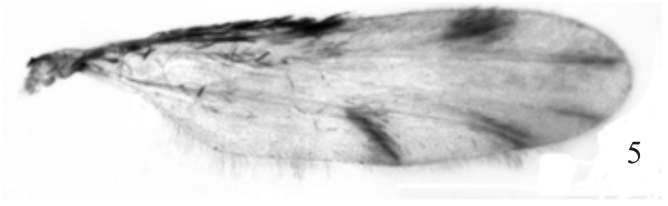
Male, moderate size, body brown.

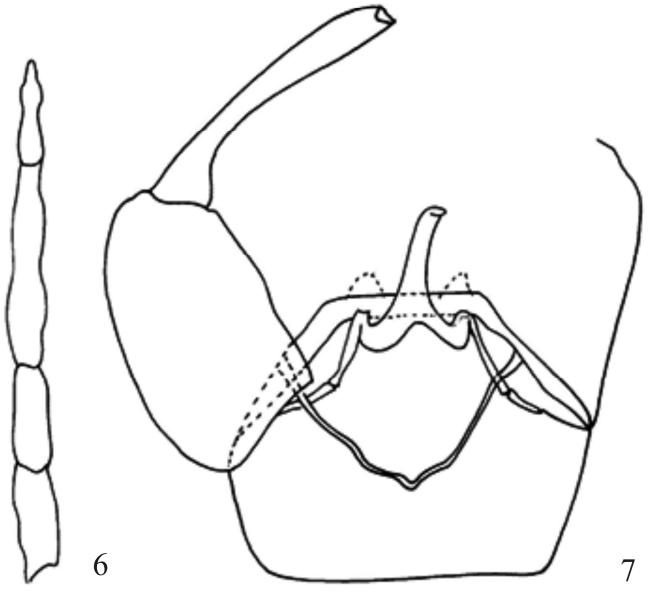
Head. Eyes broadly contiguous, bare. Antenna (Fig. 6) pale brown, with long and dense plume setae, well-developed; distal approximate 1/3 of plume setae yellow, 2/3 brown; the 12th segment is the longest and roughly 1.5 times longer than 13rd; AR 1.4. Palpal with lengths of segments in proportions of 12-12-35-15; the third segment elongate and slightly swollen in the mid-length, without any sensory pit; segments 4–5 fused together.

Thorax. Brownish, mesonotum yellowish-brown, posterior border of scutellum with 7 stout bristles. Wing length 1.36 mm, width 0.36 mm (n = 2), macrotrichia abundant in the wing; a predominantly dark band on costal margin and dark spot formed by dense macrotrichia over the second radial cell; a dark spot located at the middle of cell R5 and at base of vein M1, M2, M3+4, and Cu1 (Fig. 5), CR 0.47. Legs dark brown, hind tibia with 5 bristles, each leg with pale bands, the apex of hind tibia pale, TR (I)1.83, TR (II)-, TR (III)1.20. F-T(I) 155 :

154 : 115 : 62 : 45: 30 : 22, F-T(II) 188 : 223: -: -: -: -: -, F-T(III) 190 : 225 : 108 : 90 : 60 : 38 : 25.

Abdomen. Dark brown, genitalia dististyle slender and stout at the tip. Gonostylus slender, V-shaped, aedeagal parameral with slender median apophysis, ending slightly curved (Fig. 7).





Figures 5–7. *Forcipomyia* (*Caloforcipomyia*) *longipenis* Yu and Liu sp. nov. (male). 5. Wing photograph; 6. Antenna; 7. Genitalia.

Holotype. 1♂, **China**, Jiangxi Province, Jinggangshan Mountain, N26° 38.714, E114° 13.232, collected on 16-X-2011, by CDC light trap. Holotype is deposited in the Medical Entomology Collection of Institute of Microbiology and Epidemiology, Academy of Military Medical Sciences, Beijing, China.

Distribution. Jinggangshan Mountain, Jiangxi Province, China, known only from the type locality.

Etymology. This species epithet is named after the long penis.

Remarks. This is the fourth species of the subgenus of *Caloforcipomyia* recorded in China. This species resembles *F.* (*Ca.*) *quokkae* Debenham, 1987, *F.* (*Ca.*) *viridis* Clastrier and Delecolle, 1991 and *F.* (*Ca.*) *squamianulipes* Tokanaga and Murachi, 1959 in the structure of the genitalia. However, this new species is distinguished by the wing with macrotrichia, the second radial cell covered with a dark spot formed by macrotrichia, dark spot in middle of cell R_5, and having a long penis which ends slightly curved.

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